The Open Infectious Diseases Journal

Content list available at: https://openinfectiousdiseasesjournal.com

PERSPECTIVE ARTICLE

Debunking the Pandemic Potential of Monkeypox Virus: A Brief Overview of the Current Surge in Monkeypox Virus Infection

Shahid Nawaz[1,*] and Aiman Fatima[1]

[1]*Institute of Microbiology and Molecular Genetics, University of the Punjab, Lahore, Pakistan*

Abstract:

Monkeypox virus, a member of orthopoxviruses, has recently started to emerge in non-endemic countries worldwide, ringing the false alarms of a possible new epidemic as the world is already fighting the COVID-19 pandemic. However, there are some key differences in the nature of these two infections that require understanding by public health authorities in order to keep the masses safe from another psychological trauma, which has been previously associated with the COVID-19 pandemic. SARS-CoV-2 primarily affects the respiratory tract, whereas the monkeypox virus is mainly associated with skin lesions. Similarly, from symptoms to pathogenesis and from the incubation period to treatment, both infections are not alike in many aspects. Monkeypox virus infection is self-limiting and can be treated without new vaccine interventions. Its case fatality ratio is also very low compared to that of COVID-19. Though monkeypox virus infections can be treated easily, It can cause serious complications in immunocompromised individuals. Therefore, avoiding physical contact with infected individuals is recommended, and care must be taken in this regard.

Keywords: Monkeypox virus, COVID-19, Pandemic, Vaccine, Smallpox, SARS-CoV-2.

Article History	Received: July 27, 2022	Revised: August 27, 2022	Accepted: October 13, 2022

1. BACKGROUND

Monkeypox, caused by the monkeypox virus, is a viral zoonosis as the disease transmits from an infected animal to humans. Its clinical symptoms are very similar to that of smallpox, despite the fact that it is less severe than smallpox. The monkeypox virus belongs to the *orthopoxvirus* genus of the *poxviridae* family. It has two different genetic clades: one is the west African clade, and the other is the Congo basin clade. As this virus was discovered for the first time in monkeys in 1958, it is named the monkeypox virus. The first case of human monkeypox was reported in 1970 in the Democratic Republic of Congo [1, 2]. Since then, the majority of cases have been reported in African countries until 2003, when the first case outside of Africa was reported in the United States, which occurred due to contact with infected pet dogs. In this outbreak, more than 70 cases of human monkeypox were reported [3]. There are numerous other incidences reported on multiple continents, which were either associated with international travel to monkeypox-endemic countries or imported animals [4]. Although there is uncertainty about the natural reservoir of the monkeypox virus, its host range encompasses a majority of mammal species [5]. Monkeys and African rodents are known for harboring the virus and infecting humans [4]. The transmission of the monkeypox virus between humans can occur through respiratory droplets, saliva, contaminated fomites and mainly by physical contact with skin lesions. Viral shedding in feces has also been recorded [6 - 8]. Despite the resemblance to smallpox, monkeypox has a major difference in its clinical features, such as swollen lymph nodes that are typically observed after the onset of fever during the infection. The incubation period normally ranges from 7-14 days. Fever, chills, swollen lymph nodes and characteristic rash on the skin are the common symptoms of monkeypox. The recently reported cases are mostly linked to sexual contact, as the virus has been reported from MSM (Men having sex with Men) [9 - 13].

As of June 22, numerous reports have emerged regarding the multiple cases of monkeypox from 50 different countries, including those previously not known as endemic for this viral zoonosis. The majority of laboratory-confirmed cases of monkeypox have been recorded in the European region (86%), followed by the US (11%) and African (2%) regions [14]. Among those locations where not a single monkeypox case was reported in history, a high number of laboratory-confirmed cases has been documented in the US, Spain, Brazil, France, Germany, UK, Canada, Peru, Netherlands, Portugal, Italy, and Belgium. A total of 13 deaths have been confirmed so far: 7 in

* Address correspondence to this author at the Institute of Microbiology and Molecular Genetics, University of the Punjab, Lahore, Pakistan;
E-mail: shahidnawaz1992@gmail.com

previously endemic countries and 6 in non-endemic countries [15]. According to the World Health Organization reports, the number of cases is increasing in different parts of the world. Since the world's health systems are already under the burden of a pandemic caused by SARS-CoV-2, a rapid surge in the new viral outbreak has resulted in panic across the globe. However, there are some key differences between monkeypox and COVID-19, which rules out the possibility of it being a new epidemic or pandemic. For instance, the recent cases of monkeypox have no evidence of being travel linked; however, in the case of COVID-19, international travel played a vital role in its transmission. Moreover, the newly emerged cases of monkeypox are mostly diagnosed in men having sex with men (MSM). As of 21st May, 2022, 92 confirmed cases of monkeypox had been documented, while at the same time, COVID-19 was transmitted a hundred times more than monkeypox. An interesting fact regarding the recent monkeypox outbreaks is that the majority of cases were reported in the US, UK, and other European countries, which were not previously endemic for this viral disease. Despite it, only a few deaths have been reported so far. On the other hand, there were a number of deaths at the same time due to COVID-19. Moreover, there is no particular need for a new vaccine intervention for the prevention of monkeypox, and the vaccines previously used for smallpox eradication can readily protect against monkeypox virus infection. However, vaccine development was important for the prevention and treatment of infection caused by SARS-CoV-2. In addition, monkeypox virus infection is self-limiting in most cases, which means that it can be cured by itself without any therapeutic intervention. Its symptoms can last for 2 to 4 weeks. As the virus is found in skin lesions, skin-to-skin contact, including sexual contact, can serve as a major source of transmission. While in the case of COVID-19, respiratory droplets serve as the major transmission source. In the recent monkeypox cases, as well as previously recorded cases in endemic areas (tropical regions and central West Africa), the clinical symptoms of infection are mainly rash and lesions on the skin with backache and swollen lymph nodes. Whereas a variety of clinical signs and symptoms are observed in COVID-19, including fever, headache, sore throat, dry cough, and in some cases, severe complications, such as ARDS (Acute Respiratory Distress Syndrome) can also occur [1, 14, 16, 17].

CONCLUSION

A recent surge of monkeypox virus infections in non-endemic countries has caused panic among the masses and health authorities worldwide. While comparing the monkeypox virus to COVID-19, some key differences can be observed in the nature of both viruses. The pandemic potential of SARS-CoV-2 is due to its more virulent nature, the severity of infection, and rapid transmission using different ways compared to the monkeypox virus, which rules out the possibility of a monkeypox epidemic or pandemic. However, monkeypox virus infection is also not easy to handle, and extreme care should be taken to avoid physical contact with a suspected infected individual. Furthermore, most of the population is already protected against monkeypox, as vaccines used against smallpox can readily protect against the monkeypox virus. If necessary, smallpox vaccines may be administered in high-risk areas. Therefore, it eliminates the requirement for the development of a new vaccine against the monkeypox virus.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

[1] World Health Organization. Multi-country monkeypox outbreak in non-endemic countries. Available from:https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON385 (Accessed on: May 21, 2022).

[2] Damon IK. Status of human monkeypox: clinical disease, epidemiology and research. Vaccine 2011; 29(S4): D54-9. [http://dx.doi.org/10.1016/j.vaccine.2011.04.014] [PMID: 22185831]

[3] World Health Organization. Monkeypox. Available from:https://www.who.int/news-room/fact-sheets/detail/monkeypox (Accessed on: May 19, 2022).

[4] 4. Centers for Disease Control and Prevention. About Monkeypox. Available from:https://www.cdc.gov/poxvirus/monkeypox/about.html (Accessed on: July 22, 2022).

[5] Khodakevich L, Jezek Z, Kinzanzka K. Isolation of monkeypox virus from wild squirrel infected in nature. Lancet 1986; 327(8472): 98-9. [http://dx.doi.org/10.1016/S0140-6736(86)90748-8] [PMID: 2867342]

[6] Radonić A, Metzger S, Dabrowski PW, *et al.* Fatal monkeypox in wild-living sooty mangabey, Côte d'Ivoire, 2012. Emerg Infect Dis 2014; 20(6): 1009-11. [http://dx.doi.org/10.3201/eid2006.131329] [PMID: 24857667]

[7] Jezek Z, Grab B, Szczeniowski MV, Paluku KM, Mutombo M. Human monkeypox: Secondary attack rates. Bull World Health Organ 1988; 66(4): 465-70. [PMID: 2844429]

[8] Rizk JG, Lippi G, Henry BM, Forthal DN, Rizk Y. Prevention and treatment of monkeypox. Drugs 2022; 82(9): 957-63. [http://dx.doi.org/10.1007/s40265-022-01742-y] [PMID: 35763248]

[9] Time. There's Already a Monkeypox Vaccine. But Not Everyone May Need It. Available from:https://time.com/6179429/monkeypox-vaccine/ (Accessed on: May 27, 2022).

[10] Health News. Monkeypox likely spread by sex at two raves in Europe, expert says. Available from:https://www.nbcnews.com/health/health-news/monkeypox-likely-spread-sex-two-raves-europe-expert-says-rcna30055 (Accessed on: May 23, 2022).

[11] Centers for Disease Control and Prevention. CDC and Health Partners Responding to Monkeypox Case in the U.S. Available from:https://www.cdc.gov/media/releases/2022/s0518-monkeypox-case.html (Accessed on: May 18, 2022).

[12] 1The Guardian. Monkeypox outbreak: WHO working on sexual contact theory, top adviser says. Available from:https://www.theguardian.com/us-news/2022/may/21/new-york-city-resident-monkeypox-virus-positive (Accessed on: May 21, 2022).

[13] Centers for Disease Control and Prevention. Signs and Symptoms. Available from:https://www.cdc.gov/poxvirus/monkeypox/symptoms.html (Accessed on: August 5, 2022). .

[14] World Health Organization. Multi-country monkeypox outbreak: situation update. Available from:https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON396 (Accessed on: June 27, 2022).

[15] Centers for Disease Control and Prevention. 2022 Monkeypox Outbreak Global Map. Available from:https://www.cdc.gov/poxvirus/monkeypox/response/2022/world-

map.html (Accessed on: August 25, 2022).

[16] Jacobs BL, Langland JO, Kibler KV, *et al.* Vaccinia virus vaccines: Past, present and future. Antiviral Res 2009; 84(1): 1-13. [http://dx.doi.org/10.1016/j.antiviral.2009.06.006] [PMID: 19563829]

[17] Nawaz S. COVID-19, SARS -CoV-2, Origin, Transmission and Treatment Aspects, A Brief Review. Infect Disord Drug Targets 2021; 21(5): e270421186673. [http://dx.doi.org/10.2174/1871526520666201006163641] [PMID: 33023459]